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The Significance of "Surface" for Architectural Design

Posted by [Maria Lorena Lehman](#) • January 19th, 2009 • [Printer-friendly](#)

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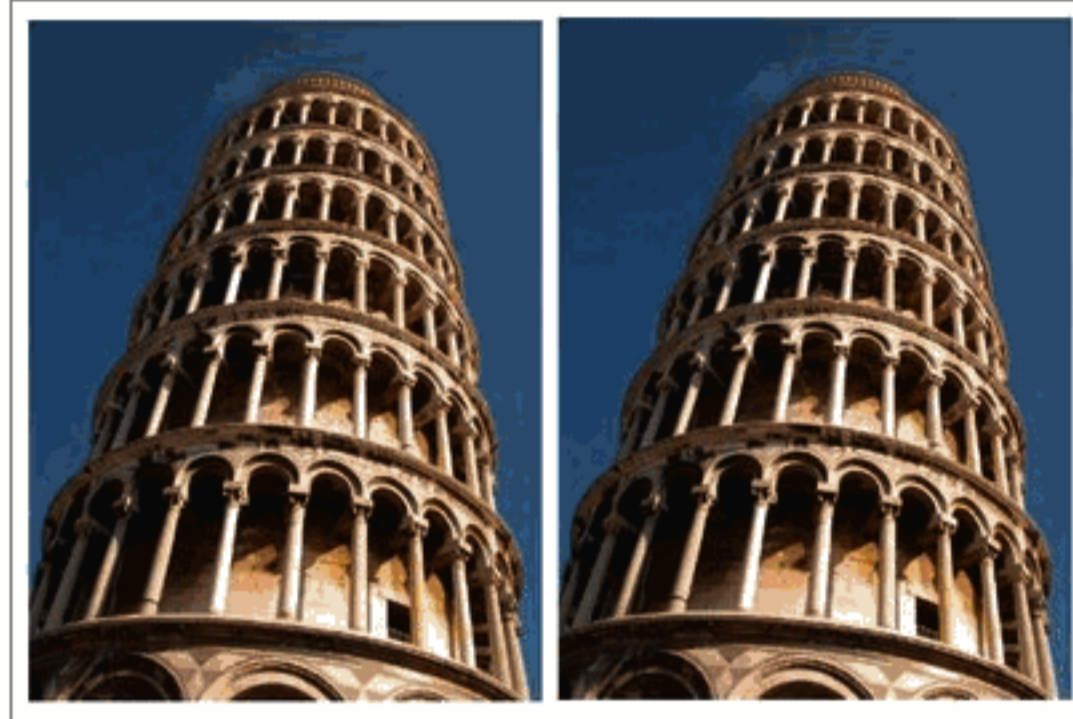


Image: *A Perspective of 3-D Visual Illusions* | *Scientific American Mind*

The way humans perceive the world is through their senses that use certain rules by which they navigate. For instance, the use of perspective, stereopsis, occlusion, shading and sfumato are all listed in *Scientific American Mind's* article *A Perspective on 3-D Visual Illusions* as rules that "create a 3D formation about our world". The human brain and nervous system sees this 3-dimensional world on 2-dimensional eye retinas. Thus, rules are used to constantly interpret between the 2-D world and the 3-D world.(1)

One example proving this inference between the 3-dimensional and the 2-dimensional is the visual illusion of the Leaning Tower of Pisa. When two images of the receding tower are placed next to one another, the tower to the right seems to lean at a greater angle than the image to the left. This is because the human eyes want to see the tower image to the right as parallel to the tower image to the left. This cannot happen because both images are receding; the brain reconfigures the images to diverge. In other words, the brain reconstructs a third dimension.(1)

Illusions like the Tower of Pisa illusion give us proof that our brains use rules to navigate the world. When 3-D is placed on 2-D this often tricks the mind into "seeing" differently. So, what does this mean for architecture? How is the 2-D within **architectural design** evolving? Why is the use of surface so important? What new illusions might we uncover in the future as the use of surface in architecture continues to advance?

Since early times, 2-D surface has been used to create illusions and representations of our 3-D world. At times, our eyes navigate 2-D surface using 3-D navigation rules. This is most evident when we see perspective drawings on a canvas or building surface. Artists and architects alike make the most of our visual sensory system to use surface to create space. Within architecture, for example, the use of perspective on actual building surface can greatly modify spatial character.

Now, with the digital revolution, architectural space can be manipulated evermore by using surface. Architects are going beyond merely painting or applying a surface coating or facing. Architectural surface can literally become space that our eyes move through. With digital media, motion can also be applied to such surfaces, giving space more depths and varying dynamic movements. On very thin screens, humans are now able to navigate 3-D virtual space. At the same time, since this is virtual space – designers may challenge the rules that we humans have come to understand in the real world. (Rules of physics like gravity, friction and inertia can be altered to create certain environmental constructs.)

Nanotechnology is also changing the way architects and designers think of surface. As materials are constructed at the atomic and molecular level, nanotechnology has the power to alter material behavior. Such materials may be used to construct architecture and may transform the way occupants expect materials to perform. As materials become stronger, lighter and cleaner, surface applications will fundamentally change. Just imagine a **surface** that is perceived as strong and durable as opposed to vulnerable and delicate. The possibilities are immense.

Surfaces are becoming increasingly transient. As we advance further into the future, smart materials will continue to advance and alter the way building materials function. Now, we have glass that can change transparencies and sensors that can actuate LED surface lighting. In effect, the notion of "surface" is changing, and our perception of what we think 2-D space can do is expanding. We have come a long way from discovering the rules of perspective; yet, we are just beginning to understand the brain, its systems and the illusions that define them. Still, it is with the advancement of "surface" that 3-dimensional space continues to evolve – a direct influence from the human sensory system and how it navigates the world.

(1) Madnik, Stephen L. & Martinez-Conde, Susana. *A Perspective on 3-D Visual Illusions*. *Scientific American Mind Magazine*. October/November 2008.